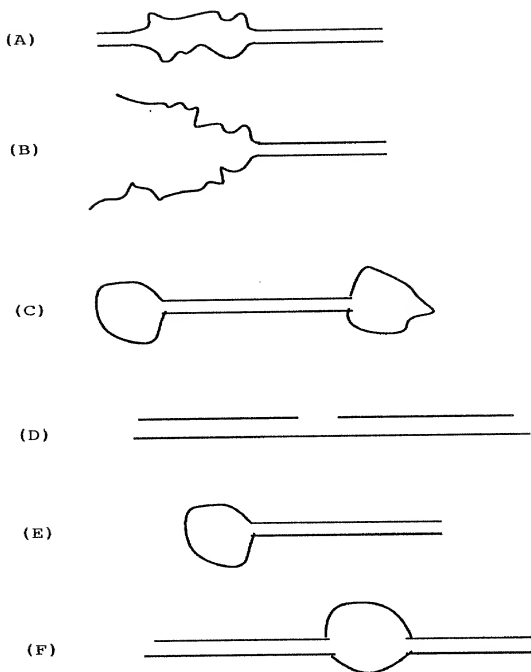


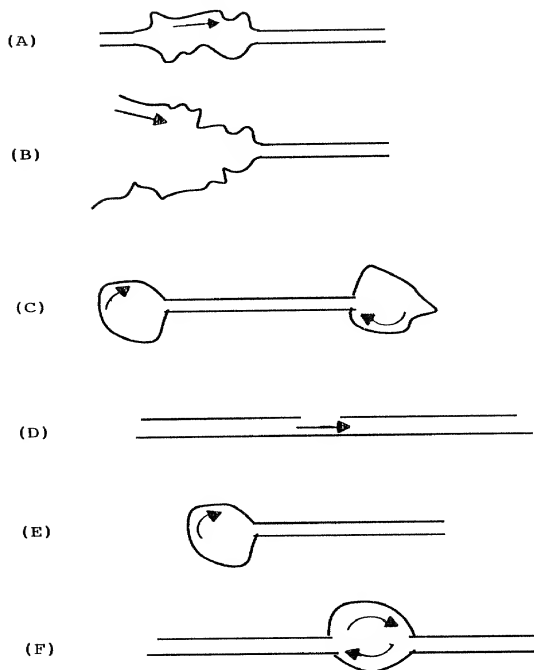
1/23



**Figure 1 (A-F)**

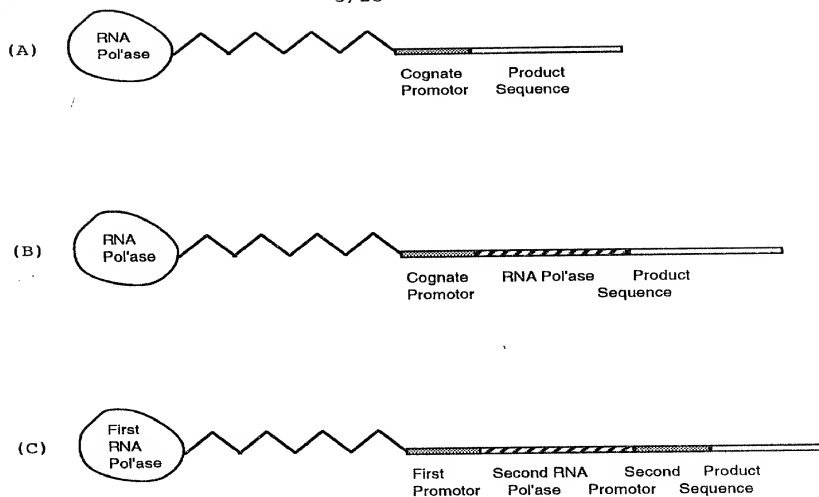
**Construct Forms Comprising at Least one Single-Stranded Region**

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**Figure 2 (A-F)**

**Functional Forms of the Construct**



**Figure 3 (A-C)**

**Three Constructs with an RNA Polymerase  
Covalently Attached to a Transcribing Cassette**

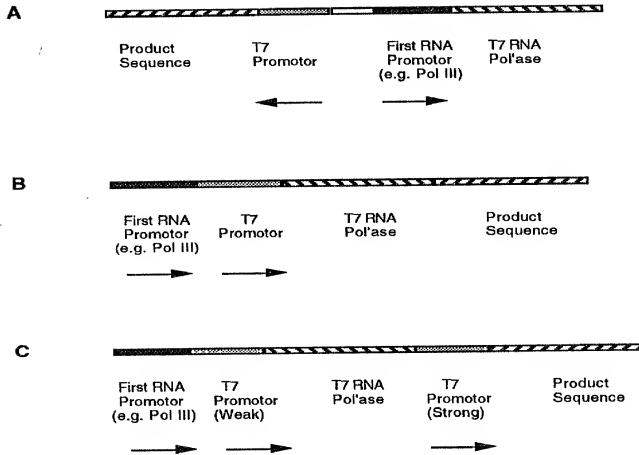


Figure 4 (A-C)

**Three Constructs with Promoters  
for Endogenous RNA Polymerase**

M13mp18. Seq Length: 7250

1.	AATGCTACTA	CTATTAGTAG	AATTGATGCC	ACCTTTTCAG	CTGGGGGGCC
51.	AAATGAAAAT	ATAGCTAAAC	AGGTTATTGA	CCATTTCGGA	AATGTATCTA
101.	ATGGTCAAA	TAAATCTACT	CGTTCCGAGA	ATTGGGAATC	AACTGTTACA
151.	TGGAATGAAA	CTTCAGACA	CCGTACTTTA	GTTGCATATT	TAAAACATGT
201.	TGAGCTACAG	CACCAGATTC	AGCAATTAAG	CTCTAAGCCA	TCGGCAAAAA
251.	TGACCTCTTA	TCAAAGGAG	CAATTAAAGG	TACTCTCTAA	TCCTGACCTG
301.	TTGGAGTTTG	CTTCGGTCT	GGTTCCGCTT	GAAGCTCGAA	TTAAAGGGGG
351.	ATATTTGAAG	TCTTTGGGG	TTCCTCTTAA	TCTTTTGTAT	GCAATCGGCT
401.	TTGCTTCTGA	CTATAATAGT	CAGGGTAAAG	ACCTGATTTT	TGATTATATG
451.	TCATCTCGT	TTTCTGAAC	GTTTAAAGCA	TTTGGGGGG	ATTCAATGAA
501.	TATTTATGAC	GATTCGGCAG	TATTGGACGC	TATCCAGTCT	AAACATTTTA
551.	CTATTACCCC	CTCTGGGAAA	ACTTCTTTTG	CAAAAGCCCT	TCGCTATTTT
601.	GGTTTTTATC	GTCGTCGGT	AAACGAGGGT	TATGATAGTG	TTGCTCTTAC
651.	TATGCCCTGT	AATTCCTTTT	GGCGTTATGT	ATCTGCATTA	GTTGAATGTG
701.	GTATTCCTAA	ATCTCAACTG	ATGAATCTTT	CTAAGCTGTA	TAATGTTGTT
751.	CCGTTAGTTC	GTTTTATTAA	CGTAGATTTT	TCTTCCCAAC	GTCCTGACTG
801.	GTATAATGAG	CCAGTTCCTA	AAATGCGATA	AGGTAATTCA	CAATGATTAA
851.	AGTTGAAATT	AAACCATCTC	AAGCCCAATT	TACTACTCGT	TCTGGTGTTC
901.	TCGTCAGGGC	AAGCTTATT	CAGTGAATGA	GCAGCTTTGT	TACGTTGATT
951.	TGGGTAAATGA	ATATCCGGTT	CTGTGGAAG	ATTACTCTTG	ATGAAGGTCA
1001.	GCCAGCCTAT	GCGCCTGGTC	TGTACACCGT	TCATCTGTCC	TCTTTCAAAG
1051.	TTGGTCAGTT	CGGTTCCCTT	ATGATTGAAC	GTCGCGCCCT	CGTTCCGGCT
1101.	AAGTAACATG	GAGCAGGTCG	CGGATTTCGA	CACAATTAT	CAGGCGATGA
1151.	TACAAATCTC	CGTTGTACCT	TGTTTCGGCC	TTGGTATAAT	CGCTGGGGGT
1201.	CAAGATGAG	TGTTTTAGTG	TATTCTTTCC	CCCTCTTCTG	TTTAGGTTGG

Figure 5

## M13mp18 Nucleic Acid Sequence

1251	TGCGCTTGTGTA	GTGGCATTAC	GTATTTTACC	CGTTTAATGG	AAACTTCTCTC
1301	ATGAAAAAGT	CTTTAGTCCT	CAAAGCCTCT	GTAGCGGTG	CTACCGCTGT
1351	TCGATGCTG	TCCTTCGCTG	CTGAGGGTGA	CGATCCGCA	AAAGCGGCT
1401	TTAACTCCCT	GCAAGCCTCA	GCGACCGAAT	ATATCGGTTA	TGGGTGGGG
1451	ATGGTTGTG	TCATTGTGG	CGCAACTATC	GGTATCAAGC	TGTTTAAGAA
1501	ATTCACTCG	AAAGCAAGCT	GATAAACCGA	TACAATTAAT	GGCTCCTTTT
1551	GGAGCCTTTT	TTTTTGGAGA	TTTTCAACGT	GAATAATTA	TTATTCGCA
1601	TTCTTTAGT	TGTTCTTTC	TATTCTCACT	CGCTGAAC	TGTTGAAAGT
1651	TGTTTAGCA	AACCCATAC	AGAAAATTC	TTTACTAACG	TCTGGAAGAA
1701	CGACAAAAT	TTAGATCGTT	ACGCTAACTA	TGAGGGTTGT	CTGTGGAATG
1751	CTACAGGGT	TGTAGTTTGT	ACTGGTGAAG	AAACTCACTG	TTACGGTACA
1801	TGGGTTCCTA	TTGGGCTTGC	TATCCCTGAA	AATGAGGGTG	GTGGCTCTGA
1851	GGGTGGGGT	TCTGAGGGTG	GCGTTCTGA	GGGTGGGGT	ACTAAACCTC
1901	CTGAGTACGG	TGATACACCT	ATCCGGGCT	ATACTTATAT	CAACCTCTC
1951	GAGGCGACTT	ATCGGCTGG	TACTGAGCAA	AACCGCTA	ATCCTAATCG
2001	TTCTCTTGA	GAGTCTCAGC	CTCTTAATAC	TTTCATGTTT	CAGAAATAAT
2051	GGTTCCGAAA	TAGGCGGGG	GCATTAACCTG	TTTATACGGC	CACCTGTTACT
2101	CAAGGCACTG	AACCGGTTAA	AACCTATTAC	CAGTACACTC	CTGTATCATC
2151	AAAAGCCATG	TATGACGCTT	ACTGGAAAGG	TAAATTCAGA	GACTGGGCTT
2201	CAAGGCACTG	AACCGGTTAA	AACCTATTAC	CAGTACACTC	CTGTATCATC
2151	AAAAGCCATG	TGCGCTCAAC	TCCTGTCAAT	GCTGGCGGG	GCTCTGGTGG
2201	TCCATTCTGG	CTTTAATCAA	GATCCATTGG	TTTGTGAATA	TCAAGGCCAA
2251	TGCTCTGACC	TGCGCTCAAC	TCCTGTCAAT	GCTGGCGGG	GCTCTGGTGG
2301	TGGTTCTGGT	GGCGGCTCTG	AGGGTGGTGG	CTCTGAGGCT	GGCGGTTCTG
2351	AGGGTGGGG	CTCTGAGGGA	GGCGGTTCCG	GTGGTGGCTC	TGGTTCCGGT
2401	GATTTTGATT	ATGAAAAGAT	GGCAAAAGCT	AATAGGGGG	CTATGACCGA
2451	AAATGCCGAT	GA AAAAGGCG	TACAGTCTGA	CGCTAAAGGC	AAACTTGATT

Figure 5

## M13mp18 Nucleic Acid Sequence

2501	CTGTGCTAC	TGATTACGGT	GCTGCTATCG	ATGGTTTCAT	TGGTGACGTT
2551	TCGGGCTTG	CTAATGGTAA	TGGTGCTACT	GGTGATTTTG	CTGGCTCTAA
2601	TTOCAAATG	GCTCAAGTCG	GTGACGGTGA	TAATTCACCT	TTAATGAATA
2651	ATTTCGGTCA	ATATTTACCT	TOOCTOCTC	AATCGGTTGA	ATGTGGOOCT
2701	TTTGTCTTTA	GCGCTGGTAA	ACCATATGAA	TTTTCTATTG	ATTGTGACAA
2751	AATAAACTTA	TTGGTGGTG	TCTTTGCGTT	TCTTTTATAT	GTGGCACCT
2801	TTATGTATGT	ATTTTCTAOG	TTTGCTAACA	TACTGGGTAA	TAAGGAGTCT
2851	TTATCATGCC	AGTTCCTTTG	GGTATTOOCT	TATTATTGCG	TTTCTCGGT
2901	TTCTCTTGG	TAACCTTGTT	CGGCTATCTG	CTTACTTTTC	TTAAAAGGG
2951	CTTCGGTAAG	ATAGCTATTG	CTATTTCAAT	GTTCCTTGCT	CTTATTATTG
3001	GGCTTAACTC	AATTCCTGTG	GGTTATCTCT	CTGATATTAG	CGCTCAATTA
3051	COCTCTGACT	TTGTTCAAGG	TGTTCAAGTTA	ATTCTOOCT	CTAATGCGCT
3101	TCCTGTTTT	TATGTTATTC	TCTCTGTAAA	GGCTGCTATT	TTCATTTTTG
3151	ACGTTAAACA	AAAAATOGTT	TCTTATTGG	ATTGGGATAA	ATAATATGGC
3201	TGTTTATTTT	GTAACCTGCA	AATTAGGCTC	TGGAAAGAAG	CTGGTTAGOG
3251	TTGGTAAGAT	TCAGGATAAA	ATTGTAGCTG	GGTGCAAAAT	AGCAACTAAT
3301	CTTGATTTAA	GGCTTCAAAA	OCTOOOGCAA	GTOGGGAGGT	TOGCTAAAAC
3351	GCTCGCGTT	CTTAGAATAC	CGGATAAGOC	TTCTATATCT	GATTTGCTTG
3401	CTATTGGGCG	CGGTAATGAT	TOCTACGAATG	AAAATAAAAA	CGGCTTGCTT
3451	GTTCTOGATG	AGTGGGGTAC	TTGGTTTAAT	ACCGTTCTT	GGATGATAA
3501	GGAAGACAG	OCGATTATTG	ATTGGTTTCT	ACTGCTCGT	AAATTAGGAT
3551	GGGATATTAT	TTTTCTTGTT	CAGGACTTAT	CTATTGTTGA	TAAACAGGCG
3601	CGTTCTGCAT	TAGCTGAACA	TGTTGTTTAT	TGTGCTGTC	TGGACAGAA
3651	TACTTTACCT	TTTGTOGGTA	CTTTATATTC	TCTTATTACT	GGCTGAAAA
3701	TGCTCTGOC	TAAATTACAT	GTTGGGGTTG	TTAAATATGG	CGATTCTCAA
3751	TTAAGOOCTA	CTGTTGAGOG	TTGGCTTTAT	ACTGGAAGA	ATTTGTATAA
3801	CGCATATGAT	ACTAAACAGG	CTTTTCTAG	TAATTATGAT	TCGGTGTTT

Figure 5

M13mp18 Nucleic Acid Sequence

3851 ATTCTTATTT AACGCCATT TATCACAAG GTGGGTATTT CAAACCATTA  
 3901 AATTTAGGTC AGAAGATGAA ATTAACATAA ATAATATTGA AAAAGTTTTG  
 3951 TCGGCTTCTT TGTCTTGGGA TTGGATTGTC ATCAGCATTT ACATATAGTT  
 4001 ATATAACCCA ACGTAAGGCG GAGGTTAAAA AGGTAGTCTC TCAGACCTAT  
 4051 GATTTTGATA AATTCACAT TGACTCTTCT CAGCGTCTTA ATCTAAGCTA  
 4101 TCGCTATGTT TTCAAGGATT CTAAGGGAAA ATTAATTAAT AGGAGCGATT  
 4151 TACAGAAGCA AGGTTATTCA CTCACATATA TTGATTTATG TACTGTTTCC  
 4201 ATTAAAAAAG GTAATTCAAA TGAAATTGTT AAATGTAATT AATTTTGTTT  
 4251 TCTTGATGTT TGTTTCATCA TCTTCTTTTG CTCAGGTAAT TGAAATGAAT  
 4301 AATTCGGCTC TGGGCGATTT TGTAACCTGG TATTCAAAGC AATCAGGCGA  
 4351 AATCGGTTATT GTTCTCCCG ATGTAAAAGG TACTGTTACT GTATATTCAT  
 4401 CTGACGTTAA ACGTGAAAT CTACGCAATT TCTTTATTTC TGTTTACGTT  
 4451 GCTAATAATT TTGATAATGGT TGGTTCAATT CCTTCCATAA TTCAGAAGTA  
 4501 TAATCCAAAC AATCAGGATT ATATTGATGA ATTGOCATCA TCTGATAATC  
 4551 AGGAATATGA TGATAATTCC GCTCCTTCTG GTGGTTTCTT TGTTCCGCAA  
 4601 AATGATAATG TTAAGCAAA TTTTAAAATT AATAACGTTT GGGCAAAAGG  
 4651 TTTAATACGA GTTGTGGAAT TGTTTGTAAG GTCTAATACT TCTAAATCCT  
 4701 CAAATGTATT ATCTATTGAC GGCTCTAATC TATTAGTTGT TAGTGCTCCT  
 4751 AAAGATAITTT TAGATAAACC TCTCAATTC CTTTCTACTG TTGATTTGOC  
 4801 AACTGACCAG ATATTGATTG AGGGTTTGAT ATTTGAGGTT CAGCAAGGTG  
 4851 ATGCTTTAGA TTTTTCATTT GCTGCTGGCT CTCAGGTTGG CACTGTTGCA  
 4901 GCGGGTGTTA ATACTGACCG CCTCACCTCT GTTTTATCTT CTGCTGGTGG  
 4951 TTCGTTGGT ATTTTAAATG GCGATGTTTT AGGGCTATCA GTTGCGCAT  
 5001 TAAAGACTAA TAGCCATTCA AAAATATTGT CTGTGCAAGC TATCTTACG  
 5051 CTTTCAGGTC AGAAGGGTTC TATCTCTGTT GGCAGAAATG TCCCTTTTAT  
 5101 TAAAGACTAA TAGCCATTCA AAAATATTGT CTGTGCAAGC TATCTTACG  
 5151 CGATTGAGCG TCAAAATGTA GGTATTTCCA TGAGCGTTTT TCTGTGTGCA

Figure 5

## M13mp18 Nucleic Acid Sequence



5201	ATGGCTGGG	GTAATATTGT	TCTGGATATT	ACCAGCAAGG	CCGATAGTTT
5251	GAGTCTCT	ACTCAGGCAA	GTGATGTTAT	TACTAATCAA	AGAAGTATTG
5301	CTACAACGGT	TAATTTGCGT	GATGGAAGAG	CTCTTTTACT	GGGTGGGCTC
5351	ACTGATTATA	AAACACTTC	TCAAGATTCT	GGGTACGGT	TCTGTCTAA
5401	AATCCCTTTA	ATCGGCTCC	TGTTTAGCTC	CGCTCTGAT	TCCAAAGAGG
5451	AAAGCAAGTT	ATACTGCTC	GTCAAAGCAA	CCATAGTAG	CGGCTGTAG
5501	CGGCGCATT	AGCGCGCGG	GTGTGGTGGT	TACGGCAGC	GTGACCGCTA
5551	CACTTGCCAG	CGGCTAGCG	CGGCTCCTT	TGCTTTCTT	CCCTTCTTT
5601	CTCGCCAGT	TGGCGGCTT	TCCCGTCAA	GCTCTAAATC	GGGGGCTCC
5651	TTTAGGGTTC	CGATTTAGTG	CTTTACGGCA	CCGACGCC	AAAAAAGCTG
5701	ATTGGGTGA	TGGTTCAGT	AGTGGGCGAT	CGGCTGATA	GACGGTTTTT
5751	CGGCTTTGA	CGTTGGAGTC	CACGTTCTTT	AATAGTGGAC	TCTTGTTCOA
5801	AACTGGAACA	CACTCAAGC	CTATCTGGG	CTATTCTTTT	GATTTATAAG
5851	GGATTTTGCC	GATTTGGAA	CCACATCAA	ACAGGATTTT	CGCTGCTGG
5901	GGCAAAACAG	CGTGGAGCG	TTGCTGCAAC	TCTCTCAGG	CCAGGGGGTG
5951	AAGGGCAATC	AGCTGTTGCC	CGTCTGCTG	GTGAAAAGAA	AAACACCGCT
6001	GGGGCCCAAT	ACGCAAAAG	CTCTCCCGG	CGGTTGGCC	GATTCATTAA
6051	TGCAGCTGGC	ACGACAGGTT	TCCGACTGG	AAAGGGGGCA	GTGAGGCGAA
6101	CGCAATTAAT	GTGAGTTAGC	TCACTCATT	GGCAGCCAG	GCTTTACACT
6151	TTATGCTTCC	GGCTCGTATG	TTGTGTGGAA	TTGTGAGGG	ATAACAATTT
6201	CACACAGGAA	ACAGCTATGA	CCATGATTAC	GAATTGAGC	TGGTACCGG
6251	GGATCTCTCT	AGAGTGAAC	TGCAGGCATG	CAAGCTTGGC	ACTGGGCGTC
6301	GTTTACAAC	GTGTTGACTG	GGAAAAAGCT	GGGTTAGCC	AACCTAATCG
6351	CTTGACAGCA	CAATCCGCTT	TGGCAGCTG	GGGTAATAGC	GAGAGGGGCC
6401	GCAAGGATCG	CCCTTCCAA	CAGTTGGCA	GCTGAATGG	CGAATGGGCG
6451	TTTGCTGTGT	TTCCGGCAAC	AGAAGGGGGT	CGGAAAGCT	GGCTGGAGTG
6501	CGATCTTCT	GAGGCGGATA	CGGTGCTGT	CCCTCAAAAC	TGGCAGATGC

Figure 5

M13mp18 Nucleic Acid Sequence

6551	ACGGTTACGA	TGCGGCCATC	TACACCAACG	TAACTATCC	CATTACGGTC
6601	AATCGCGCGT	TTGTTCCAC	GGAGAATCG	ACGGGTTGTT	ACTCGCTCAC
6651	ATTTAATGTT	GATGAAAGCT	GGCTACAGGA	AGGCGAGAG	CGAATTATTT
6701	TTGATGGCGT	TCCTATTGGT	TAAAAAATGA	GCTGATTAA	CAAAAATTTA
6751	ACGCGAATTT	TAACAAAATA	TTAACGTTTA	CAATTTAAAT	ATTTGCTTAT
6801	ACAATCTCC	TGTTTTTGGG	GCTTTTCTGA	TTATCAACCG	GGGTACATAT
6851	GATTGACATG	CTAGTTTTAC	GATTACCGTT	CATCGATTCT	CTTGTTTGCT
6901	CCAGACTCTC	AGGCAATGAC	CTGATAGCCT	TTGTAGATCT	CTCAAAAATA
6951	GCTACCCCTCT	CCGGCATGAA	TTTATCAGCT	AGAACGGTTG	AATATCATAT
7001	TGATGGTGAT	TTGACTGTCT	CCGGCCTTC	TCACCCCTTT	GAATCTTTAC
7051	CTACACATTA	CTCAGGCATT	GCATTTAAAA	TATATGAGGG	TTCTAAAAAT
7101	TTTTATCCTT	GCGTTGAAAT	AAAGGCTTCT	CCCGCAAAAG	TATTACAGGG
7151	TCATAATGTT	TTTGGTACAA	CCGATTAGC	TTTATGCTCT	GAGGCTTTAT

Figure 5

## M13mp18 Nucleic Acid Sequence

## COMPLEMENTARY TO M13

POSITION	5' * 3'	POSITION	
645	AGCAACACTATCATA	631	M13/1
615	ACGACGATAAAAAOC	601	M13/2
585	TTTTGCAAAAGAAGT	571	M13/3
555	AATAGTAAATGTTT	541	M13/4
525	CAATACTGCGGAATG	511	M13/5
495	TGAATCCCCCTCAAA	481	M13/6
465	AGAAAACGAGAATGA	451	M13/7
435	CAGGTCCTTTACCOCTG	421	M13/8
405	AGGAAAGCGGATTGC	391	M13/9
375	AGGAAGCCCCGAAAGA	361	M13/10

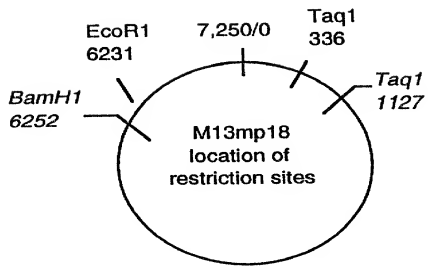
## COMPLEMENTARY TO SS PHAGE DNA

POSITION	5' * 3'	POSITION	
351	ATATTGAAGTCTTT	366	M13/11
371	TCTTTTGTATGCAAT	386	M13/12
391	CTATAATACTCAGGG	406	M13/13
411	TGATTTATGGTCATT	426	M13/14
431	GTTTAAAGCATTGA	446	M13/15
451	TATTTATGACGATTC	466	M13/16
471	TATCCAGTCTAAACA	486	M13/17
491	CTCTGGCAAAACTTC	506	M13/18
511	TCGCTATTTTGGTTT	526	M13/19
531	AAACGAGGGTTATGA	546	M13/20

Figure 6

**Primers for Nucleic Acid Production  
Derived from M13mp18 Sequence**

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**Figure 7**

**Appropriate M13mp18 Restriction Sites**

13/23



Lane 1: from calf thymus + Taq digested mp18 amplification reaction  
Lane 2: from Taq digested mp18 amplification reaction  
Lane 3: from calf thymus amplification reaction  
Lane 4: øX174 Hinf1 size marker

**Figure 8**

14/23



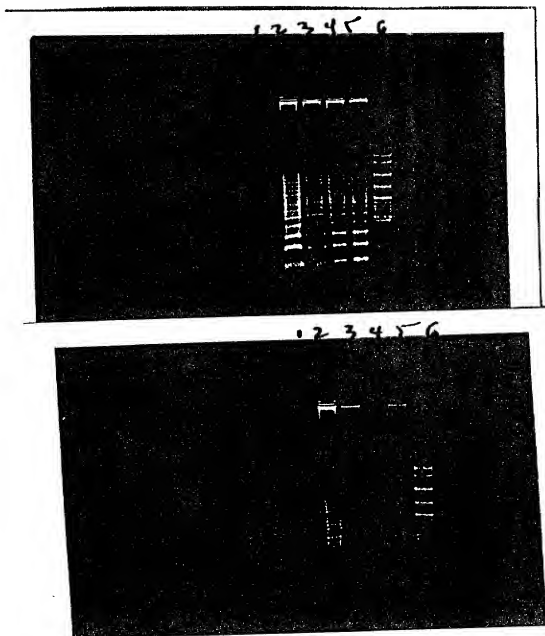
Lane 1: no template

Lane 2: mp18 template, phosphate buffer

Lane 3: MspI/pBR322 size marker

Lane 4: mp18 template, MOPS buffer

**Figure 9**

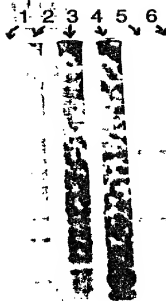


Top= (+) Template  
Bottom= (-) Template

Lane 1: phosphate buffer  
Lane 2: MES  
Lane 3: MOPS  
Lane 4: DMAB  
Lane 5: DMG  
Lane 6: pBR322/Mspl size marker

Figure 10

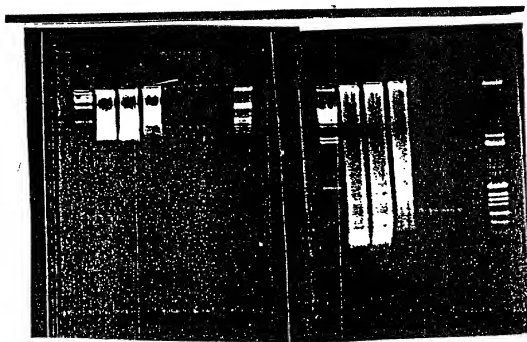
16/23



Lane 1: DMAB buffer, no template  
Lane 2: DMAB buffer, mp18 template  
Lane 3: DMG buffer, no template  
Lane 4: DMG buffer, mp18 template  
Lane 5: No reaction  
Lane 6: 200 ng Taq I digested mp18  
size marker/positive control

**Figure 11**





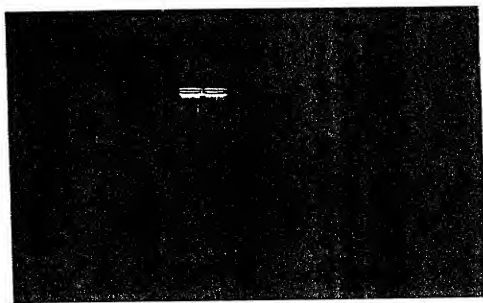
First Time Interval      Second Time Interval

#### Agarose Gel Analysis

- Lane 1: lambda Hind III marker
- Lane 2: Amp/Untreated
- Lane 3: Amp/Kinased
- Lane 4: Amp/Kinased/Ligated
- Lane 5: PCR/Untreated
- Lane 6: PCR/Kinased
- Lane 7: PCR/Kinased/Ligated
- Lane 8: øX174/HinfI marker

Figure 12

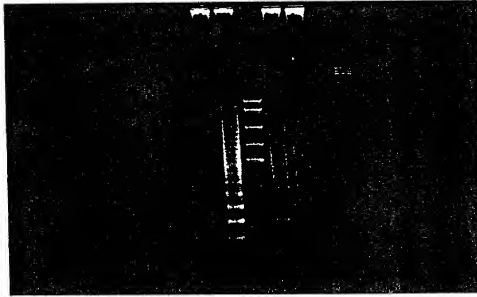
18/23



**Figure 13**

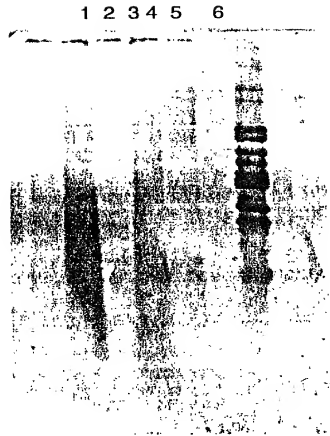
19/23

1 2 3 4 5 6



Lane 1: Primers alone  
Lane 2: Primers + taq digested M13 DNA  
Lane 3: Molecular weight markers  
Lane 4: Primers + RNA  
Lane 5: Primers alone  
Lane 6: M13 digested DNA  
Buffer was dimethyl amino glycine, pH 8.6

**Figure 14**



Lane 1: Primers alone  
Lane 2: Primers + taq digested M13 DNA  
Lane 3: Molecular weight markers  
Lane 4: Primers + RNA  
Lane 5: Primers alone  
Lane 6: M13 digested DNA  
Buffer was dimethyl amino glycine, pH 8.6

**Figure 15**

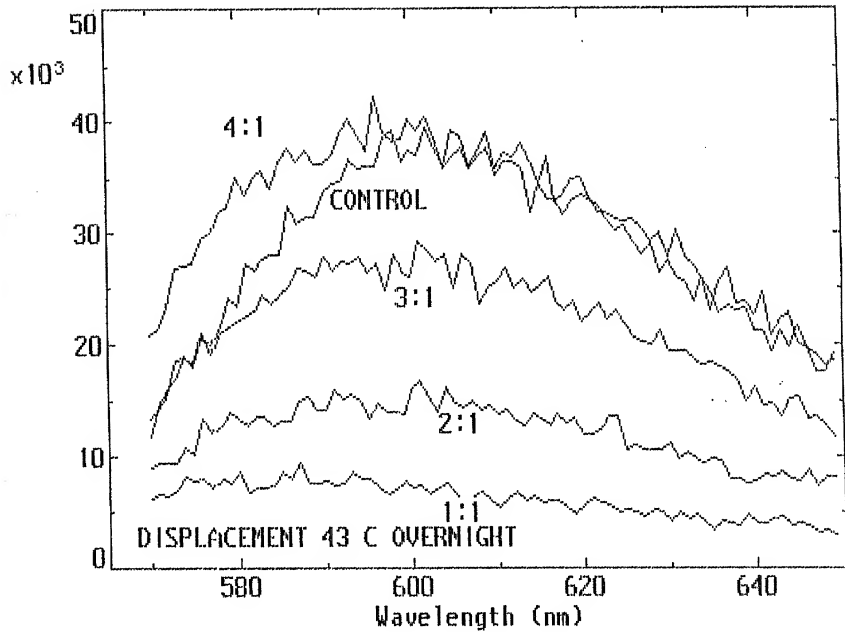


Figure 16

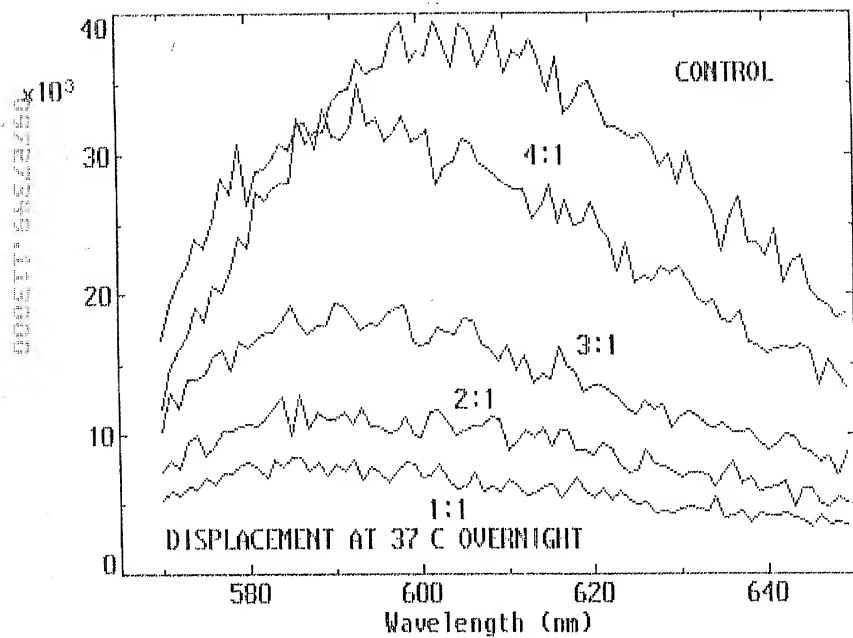


Figure 17

[illegible][illegible]